Case Report

A DESMOPLASTIC MALIGNANT MELANOMA IN A DOG

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Abstract: A desmoplastic malignant melanoma appearing on the forelimb in a dog was histopathologically examined. The tumor cells, having an oval nucleus and a spindle-shaped abundant cytoplasm, showed perivascular whorled and storiform proliferative pattern and rarely formed syncytium. They also loosely proliferated in area of myxomatous matrix occupying a part of the tumor. No melanin granules were visible in the neoplastic tissue of HE stain, but a small quantity of melanin could be seen by Fontana-Masson stain in storiform areas and locally by DOPA reaction. These granules were never recognized in the whorled proliferative area. The tumor cells were immunohistochemically positive for S-100 protein, and ultrastructurally contained cell organelles such as rER, dense body, and microfilament. Immature melanin, however, could not be detected in the tumor cells. Numerous collagen fibers were present around the neoplastic cells. These findings described above appeared to be essentially similar to those of desmoplastic melanoma of human. (*J Toxicol Pathol* 9: 113~115, 1996)

Key words: Desmoplastic, Dog, Melanoma, Pathology

Desmoplastic malignant melanoma (DMM), reported by Colney (1971) for the first time, is a variant of spindle cell malignant melanoma of human. The histological appearances consist of a large quantity of atypical spindle cells with numerous collagen fibers and simulate fibrosarcoma, neurofibrosarcoma, and MFH¹.

No melanine pigments are present in the neoplastic cells and no melanosome also in electron microscopy⁵. Therefore, diagnostic criteria of DMM is based on: 1) proliferation of intraepidermal melanocyte on surface area of the tumor and 2) observation of melanin pigments in the early developmental stage¹. Spindle cells often appear in cases of amelanotic melanoma in animals²⁻⁶. To our knowledge, however, it seems that the DMM has not been reported in dogs.

This paper shows mainly histopathological features of DMM in a dog.

Case Report

An 11-year-old male dog, Japanese species Shiba-ken, was examined for a surgical extracted tumor. Clinically at the beginning, the tumor had appeared on the left forelimb three months prior to the operation. The size of the tumor reached 2.5 cm in diameter during three months. A veterinary practitioner thought that the tumor was a granulomatous lesion because of inflammatory cells and bacterium in the stamp smear. For that reason, an antibiotic was given for a week, but since there was no improvement, the tumor was surgically removed.

The tumor, immersed in 10% formalin solution, was sent to our laboratory. The material was embedded in paraffin, sectioned and stained with hematoxylin and eosin (HE), Masson trichrome, and Fontana-Masson. In addition, DOPA reaction for cryosection, immunohistochemistry for S-100 protein, and

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Fig. 1. Cut-surface of the tumor fixed in formalin. Partially brown and black hemorrhagic lesions are seen within whitish firm surface.

electron microscopy were carried out.

Macroscopically, the cut-surface was mostly solid and whitish in color, containing partially light or dark brown regions (due to hemorrhage) at the margin and center of the tumor (Fig. 1).

Microscopically, the tumor consisted mainly of spindle cells which showed storiform and perivascular whorled proliferation, and hyperplastic collagen fibers (Fig. 2). Occasionally multinuclear giant cells were also seen. In some areas, the tumor cells were loosely proliferated in a myxomatous matrix, and necrotic and hemorrhagic lesions were present adjacent to these areas. HE stain showed proliferating melanocytes in the epidermal layer, but there were no pigments in the subdermal tumor tissue. The surface of the tumor was partly covered by the epidermis, but most of the surface was denuded by ulceration. The boundary of the tumor was obscure. In Fontana-Masson stain and DOPA reaction, however, immature melanin pigments, granular brown and black-

Fig. 2. Note the proliferation of spindle-shaped cells with collagen fibers. The tumor cells, having atypical appearance, show perivascular whorled (A) and storiform (B) proliferations. HE stain, A: $\times 100$, B: $\times 200$

Fig. 3. Note melanin pigments. A) In Fontana-Masson stain, the pigments are seen in the tumor cells (arrow). B) In DOPA reaction, the pigments are partially seen as blacky-brown granules. A: $\times 400$, B: $\times 40$

Fig. 4. Ultrastructural features of the tumor cell, having dilated rER, dense body, and microfilaments in the cytoplasm. Usually no melanosome is present. Arrow shows a melanosome-like structure with vertical stripes. $\times 30,000$

brown in color, were seen in the tumor cells (Fig. 3). The cells containing immature melanin pigments were irregularly distributed. The pigments were observed in the cells showing fibrotic and storiform arrangement, but they were not found in the whorled pattern by Fontana-Masson stain and DOPA reaction. The tumor cells were usually positive for S-100 protein.

Ultrastructurally, most of the tumor cells were characterized by slender cytoplasm with irregular projection of cell membrane, and by numerous microfilaments, dilated rER, and varying sized (about 200 to 500 nm) dense bodies within the cytoplasm. Immature melanin such as melanosome and premelanosome could not be seen in the tumor cells. Although vertical striped melanosome-like structures were rarely observed (Fig. 4).

Discussion

In this tumor it was microscopically impossible to detect melanin pigments on HE slides, and the morphology was similar to that of hemangiopericytoma, MFH, and fibrosarcoma in the proliferating area. By Fontana-Masson stain, brown colored melanin pigments were merely recognized in tumor cells arranged in a storiform pattern, and none were found in the area of whorled and myxomatous proliferation. Malignant melanoma, showing whorled and fibrotic proliferation such as this case, frequently do not exhibit melanin pigments in HE preparation. However, the immature pigments such as,

premelanosome and melanosome, can be observed by Fontana-Masson, DOPA, and electron microscopy. Melanoma, showing mainly spindle shaped cellular proliferation and collagen hyperplasia, is termed "Desmoplastic Malignant Melanoma" in human^{1,5}. Besides, DMM ultrastructurally lacks melanosome, so the diagnosis is made from examination of its growing history and from confirmation of melanin¹. The history of this tumor is obscure, but it was considered that the features such as proliferation of spindle cells and collagen fibers may belong within the category of DMM.

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